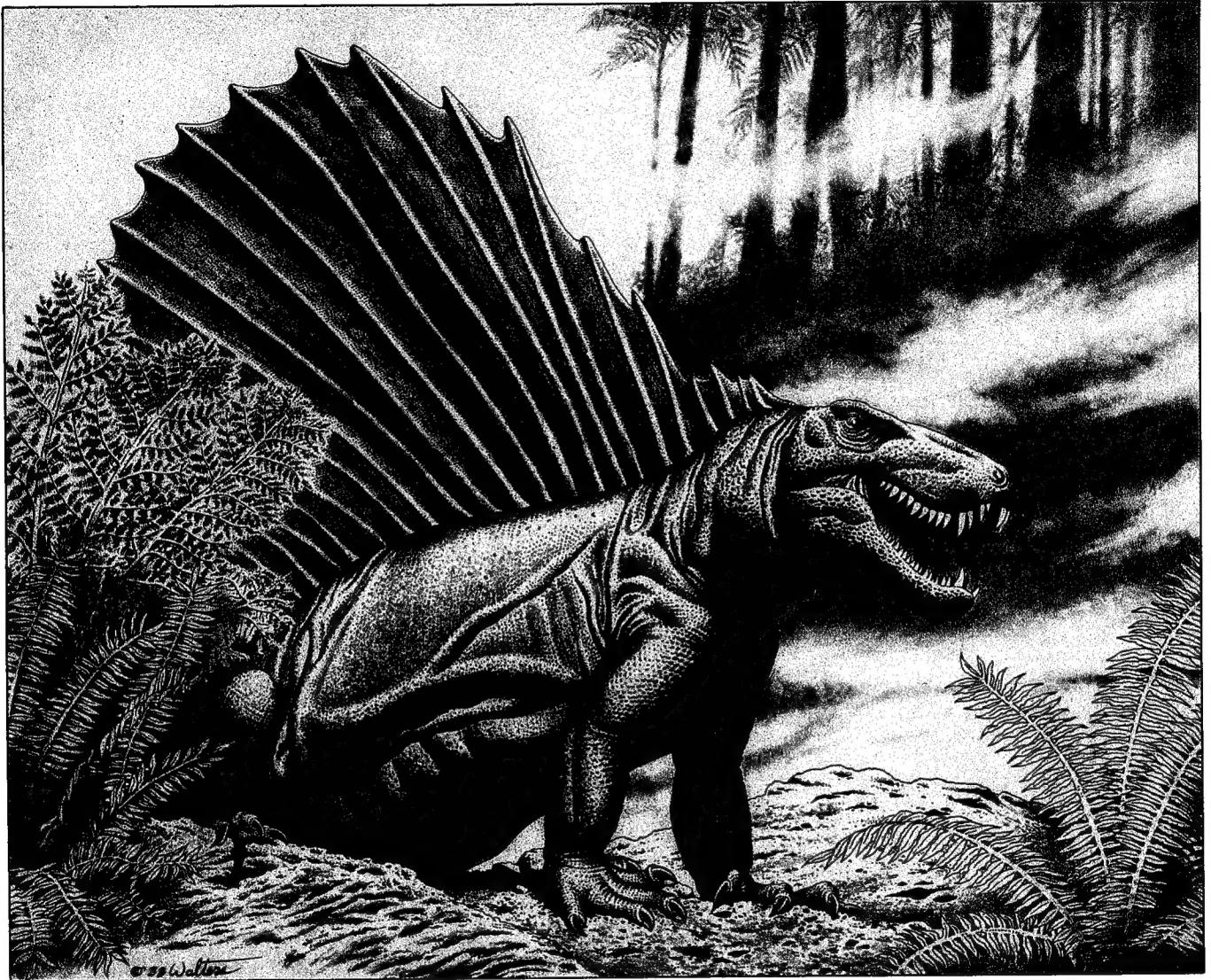


# THE MOSASAUR



## THE JOURNAL OF THE DELAWARE VALLEY PALEONTOLOGICAL SOCIETY

VOLUME IV

OCTOBER, 1989

# **The Mosasaur**

## **The Journal of the Delaware Valley Paleontological Society**

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# The Mosasaur

## The Journal of the Delaware Valley Paleontological Society

Volume IV

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Field guide to the vertebrate paleontology of Late Triassic age rocks in the southwestern Newark Basin (Newark Supergroup, New Jersey and Pennsylvania) Paul E. Olsen and John J. Flynn	1
Upper Triassic <i>Dinophyton</i> zone plant fossils from the Stockton Formation in southeastern Pennsylvania Brian J. Axsmith and Peter A. Kroehler	45
Notes on six real and supposed type fossils from the Newark Supergroup (Triassic) of Pennsylvania Earle E. Spamer	49
Medial Cretaceous carnivorous dinosaur and footprints from New Jersey Donald Baird	53
The Upper Cretaceous shark <i>Cretolamna appendiculata</i> (Agassiz) in the Raritan Formation (Cenomanian) of New Jersey Gerard R. Case	65
A predator attacks <i>Sphenodiscus</i> Frank Bukowski and Paul Bond	69
The Upper Cretaceous (Campanian, Black Creek Formation) fossil fish fauna of Phoebus Landing, Bladen County, North Carolina Albert J. Robb, III	75
The biostratigraphy of the Lower Helderbergian formations (Lower Devonian) as exposed along Wallpack Ridge, Sussex County, New Jersey Albert J. Waggenhoffer	93
Quaternary mammals from the continental shelf off New Jersey William B. Gallagher, David C. Parris, Barbara Smith Grandstaff and Craig DeTample	101
Preliminary reexamination of the Fish House local fauna and flora (Pleistocene), Pennsauken, Camden County, New Jersey Arthur E. Bogan, Earle E. Spamer, G. Christine Manville, William B. Gallagher and Arthur J. Cain	111
The vertebrate fauna from the Judith River Formation (Late Cretaceous) of Wheatland and Golden Valley Counties, Montana Anthony R. Fiorillo	127
Rediscovery of fossil material at the Academy of Natural Sciences of Philadelphia from Edward Drinker Cope's 1893 expedition to the Dakotas Edward Daeschler and Anthony R. Fiorillo	143
A historic piece of petrified wood from the Triassic of Arizona Earle E. Spamer	149
A paleontological pilgrimage through Philadelphia, the birthplace of American paleontology. II. With notes on the paleontology of Philadelphia. Earle E. Spamer and Catherine A. Forster	153
Delaware Valley Paleontological Society. "Ad amorem rerum fossam" Edward M. Laughniger	165

# A Paleontological Pilgrimage through Philadelphia, the Birthplace of American Paleontology. II.

## Including Notes on the Paleontology of Philadelphia

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### Abstract

Locations of interest in the history of paleontology in Philadelphia are visited: residences and graves of Joseph Leidy, Edward D. Cope, William Wagner, Constantine Rafinesque, Thomas B. Wilson, Samuel G. Morton, and Joseph Willcox. The several sites occupied by the Academy of Natural Sciences, from 1812 to the present, are also visited. Some remarks on fossils naturally occurring in Philadelphia are included.

### Introduction

The first part of this paleontological pilgrimage (Forster & Spamer, 1986) was prepared as a guide for a field trip offered during the 46th Annual Meeting of the Society of Vertebrate Paleontology (SVP), in November, 1986. As such, the first pilgrimage was more attentive to the history of vertebrate paleontology in this city. This second pilgrimage presents some additional notes on the history of paleontology, the paleontologists, and the paleontology of Philadelphia.

#### Part 1: The Paleontologists

#### 1 Joseph Leidy (1823-1891) and Edward Cope (1840-1897), The Wistar Institute of the University of Pennsylvania, 3601 Spruce Street

The SVP field trip in November, 1986, contained two additional stops not noted in the published field guide. Before that trip we had attempted to locate the resting places of Dr. Joseph

Leidy and Prof. Edward Drinker Cope. We knew, of course, that Cope had willed his skeleton to the Anthropometric Society, and that these remains were in the archival collections of the Department of Anthropology in the University Museum of the University of Pennsylvania. According to Cope's will, the fleshy remains were to have been cremated and placed next to the remains of his friends Joseph Leidy and Joseph Ryder (see Osborn, 1931, p. 590, or Forster & Spamer, 1986, p. 190).

We earlier had followed a lead that Leidy's remains were at the "Oddfellows Cemetery," which, we learned, is now the Mount Peace Cemetery, on the east bank of the Schuylkill River off East River Drive (Kelly Drive). Although the cemetery records list several Leidys, there are none named Joseph. However, just a couple of weeks before the field trip, William Altamari, a co-leader of the SVP trip, reported that he had found both Leidy and Cope, not in a cemetery but right in the middle of the University of Pennsylvania. In a wall on the second floor landing of the Wistar Institute, in a glass-covered recess in public



view, are the urns containing the cremated remains of Joseph Leidy and Edward Cope.

The second additional stop, arranged by Forster with special permission of the University, was a visit to the University Museum, where the attendees had the rare privilege to examine Edward Cope's skeletal remains, held by the University's Department of Anthropology. Although these remains are not catalogued into the University Museum collections, they still carry the old Wistar Institute catalogue number (4989). Edward Cope's brain, however, is missing; it is general knowledge that the brain was accidentally destroyed years ago, but we have not been able to determine the source of this information. (Leidy's brain also was removed for study immediately after his death. It was given to the Brain Society, a body of scientists to which Leidy belonged, but we do not know of the present whereabouts of the brain. Leidy's nephew, Dr. Joseph Leidy, Jr., was one of those who did the autopsy and examined the brain, and a brief report of the examination is quoted by Frazer, 1892.)

As a footnote to the first paleontological pilgrimage, where two Leidy residences are identified (one at 1302 Filbert Street and another at 2123-2125 Spruce Street; Forster & Spamer, 1986, pp. 188-189), we have since found a little more information. We have established from a postcard written by Leidy, held in the Wagner Free Institute of Science, that he moved from Filbert to Spruce about December 6, 1890; and he gave his Spruce Street address as just 2125.

Some additional information on Cope's houses at 2100 and 2102 Pine Street can also be passed along here. The houses were built ca. 1876, and Cope moved into them in 1878. He leased out the 2100 address in 1886. The property remained in the hands of heirs until 1950 (Webster, 1981). In 1975, the house at 2102 was placed on both the Pennsylvania Register of Historic Sites and Landmarks and the National Register of Historic Landmarks. A plaque, not present when the first paleontological pilgrimage was prepared, is now affixed to the house, reading:

Edward Drinker Cope House  
has been designated a

National  
Historic Landmark

This site possesses national significance  
in commemorating the history of the  
United States of America

1975  
National Park Service  
United States Department of the Interior

**2 William Wagner (1796-1885), "25" South 2nd Street; "13" North 8th Street; The Wagner Free Institute of Science, 17th Street and Montgomery Avenue; West Laurel Hill Cemetery, Bala Cynwyd, Pennsylvania.**

One of the SVP field trip stops was the Wagner Free Institute of Science, at 17th Street and Montgomery Avenue, a classical Victorian natural history museum little changed since the late 1800s. William Wagner, whose institute is a monument to his philanthropy, was a self-made merchant who, by 1847, had turned his life's work to the free education of the public in the wonders of the natural and technical sciences. At the time of the 1986 field trip, we did not know where Wagner had been buried, although it was known that he had been placed in a crypt beneath the Institute for a year just after his death. In December, 1886, his wife, Louisa Binney, had his body moved to the West Laurel Hill Cemetery, a beautifully landscaped park not far from City Line Avenue, along Belmont Avenue in Bala Cynwyd, immediately west of Philadelphia on the west bank of the Schuylkill River. Both Mr. and Mrs. Wagner rest in a small plot (no. 415) in the River Section of that cemetery. The grave is marked by a headstone as modest and unimposing as was the private life the Wagners lived.

William Wagner, the youngest of eight children of John Wagner, was born January 15, 1796, at "25" South 2nd Street (an address of the pre-1857 city-wide address changes, on the east side of the street between Market and Chestnut Streets, today an area of small businesses). Young William was reared at "13" North 8th Street, a site now occupied by the Victorian-facade building which for decades was the Lit Brothers department store. (The interior of this building has just recently been completely renovated, following a long battle to avoid demolition. It is now an office building.) Regarding the home at "13" North 8th, Wagner himself made the following recollection (Aquila, 1862):

"Such of our citizens as may carry their recollections back forty years ago will remember the fine-looking old mansion, No. 13 North Eighth street, standing some thirty feet back from the street, with side yards, the end facing the street, with the door in the centre. The encroachment of business caused its demolition many years ago, but it long occupied a prominent position as a private residence in what was termed, at the date of its erection, 'The West End.'"

Westbrook's (1885) memorial to Wagner says that the house was "a large double house . . . adjoining the residence of the late James S. Duval" (p. 7). However, it was at his father's rural home on Schoolhouse Lane, near the Wissahickon Creek in the Germantown section of the city, where William was most influenced by nature (Westbrook, 1885, pp. 7-8):

"Here his son William spent most of his childhood's sunny days and first evinced his great love of nature, and in early boyhood began the collection of curious natural specimens of a great variety--a work which was kept up with unfaltering interest during his long life, and which culminated in the large and valuable collection now contained in the Museum of the Wagner Free Institute of Science.

"It is remembered that the mother of this boy scientist found it necessary to construct his pockets of buckskin to safely contain their varied and rough contents."

After having left the employ of the mercantile trade, marrying Louisa Binney, and spending two years abroad, Wagner



began in 1847 his free lectures on science and technology. The casual talks were held in his stately home, Elm Grove (razed 1886), off what now is the northwest corner of 17th Street and Montgomery Avenue. What began as porch chat became popular lectures open to the public. Later, Wagner's lectures were held in the Commissioners' Hall of the District of Spring Garden, on the northwest corner of 13th and Spring Garden Streets. (The hall was razed for the construction of a girls' school, the building which still stands.) The Institute was forced to move in the early 1860s because the city required all of the space in the Commissioners' Hall, so Wagner had the current Institute constructed across from Elm Grove. When opened in 1865, visitors could reach the Institute, then not directly on a street, "by a long boardwalk running in from Columbia Avenue" [Leffmann, 1909, p. 208].) (Today, the site of Elm Grove is occupied by a block of row homes.)

For a historical review of the Institute and a history of the paleontological work there, see Spamer & Forster, 1988. It is also noted in that volume that the preeminent paleontologist Edward D. Cope appeared not to have any ties with the Institute, a curious circumstance considering that anyone who was anyone in Philadelphia paleontology had an active affiliation with that institution. In the time since that manuscript was prepared, many interesting items have been rediscovered in the Institute's archival collections. Included in the bundles of material which have yet to be sorted was some correspondence between Cope and Wagner. Some of the letters from Cope were written from North Carolina, pertaining to collections of fossils he was sending to the Institute. These fossils no longer exist. In 1891, Cope apparently inquired to Joseph Leidy, then President of the Faculty at the Wagner Free Institute, about the disappearance of the fossils. Leidy wrote to Cope that he suspected that they had been seen "as worthless & were accordingly carted away as rubbish" (Library of the Academy of Natural Sciences, Manuscript Collection 1).

The most startling find amongst the Cope correspondence at the Wagner Free Institute were two letters from Cope, one in 1869 and the other in 1885. The 1869 letter, dated April 24th, was written to William Wagner, beginning,

"Philada 4/24 1869

"Prof. Wm Wagner  
"Resp. Friend

"Both before and since I visited the Free Institute of Science I have been thinking of its future, and of my possible connection with it, and have such ideas on the subject as follows:"

Cope then continued for six pages to outline financial and academic aspects for the organization of the Institute and its programs. But of most significance is the following passage:

"I would be willing, under such an arrangement, to conduct the departments of Zoology & Paleontology. I would almost promise to equal Agassiz Museum in a short time with the above income, and would leave the Academy Natl Sciences behind in a very short time. Under the arrangement I propose, the institution could be made the first of the kind in America."

Cope concluded,

I would be very glad if thee would consider this letter a confidential one entirely. If thee should agree to any arrangements, the matter should be private until consummated."

Considering William Wagner's own predisposition toward the earth sciences, particularly paleontology and mineralogy, as well as his strict command of the entire operation of the Institute (a command exercised until his death), it is little wonder that Wagner did not entertain Cope's proposals. Cope never attained a position with the Institute.

William Wagner died in January, 1885. After the Board of Trustees assumed control of the Institute and its programs, Cope sent a letter to Joseph Willcox, Secretary of the Trustees. It began:

"Phila. May 12th 1885

"Mr. Willcox

"Dear Sir:

"As I understand you are, in connection with the other trustees of the Wagner Free Institute of Science, looking for instructors of organization and successful conduct of your institution . . . I take the liberty of offering some suggestions. I hope these will not be considered impatient, as my friend Prof. Lewis has already spoken to you of my willingness to placing my collection in the Institution on certain conditions."

Cope then continued to object to one-man rule of the Institute and outlined his ideas for the structure of the educational and museum-related aspects of the Institute, with financial data. He also alluded to, and denounced, those scientists who publish a few good papers and then do nothing more. He summarized this idea by saying that "the institutions of Philadelphia have lost a good deal by the employment of men who while they may be well accomplished, and good teachers, are not men of research." But, of most significance, is Cope's closing paragraph:

"It may not appear very modest in this connection, but I take the opportunity to say, that if I had the chair of Biology as projected in this letter, with the financial aid contemplated in my proposition, I would deposit my collection so as to have it displayed. I would be glad to show you such parts of it as are visible at my house 2102 Pine St. should you have time to visit it."

The Board of Trustees declined Cope's offer, but the fact that Joseph Leidy and Angelo Heilprin were already closely associated with the Institute very well may have had some influence on the decision. There is, however, indirect evidence (though nothing yet certain) in the Institute's records that Cope may have lectured there sometime in the period between 1891 and 1894. Nonetheless, these hitherto unknown letters show that the history of vertebrate paleontology in America could have been changed had the Institute taken up Cope's offer. Instead of Cope's collection being sold to the American Museum of Natural History in 1899, it might have stayed in Philadelphia. These letters will be the center of continued research into the historical implications they suggest to the reader today.

3

Constantine Samuel Rafinesque (1783-1840),  
"172" Vine Street; 9th and Bainbridge Streets(?);  
Forest Hills Cemetery(?).



C. S. Rafinesque was a Franco-American naturalist whose life has more often been reviewed in terms of his colorful personality rather than the contributions he made to the natural sciences (for a biography, see Boewe, 1982). His prolific naming of genera and species—mostly of molluscs, fishes, and plants—and the novel schemes of higher classification in which he placed these groups, have been the ongoing subject of hundreds of papers, both scientific and historical. It seems today, the vanity of his scientific contemporaries aside, that much of his work was not only good, but valid in terms of modern taxonomy. Some of Rafinesque's work dealt with fossil species, too. The scholarly debates surrounding Rafinesque continue to the present, and the ongoing attention to Rafinesquiana affects even this paleontological pilgrimage; as Boewe (1987) summarized in his wonderful title, "Who's buried in Rafinesque's tomb?"

Rafinesque arrived in Philadelphia in the Spring of 1802, and died there on September 18 or 19, 1840 (even the exact date of his death is cloaked by confusion, as Boewe, 1987, pointed out). His travels in the time between took him to Transylvania University, in Lexington, Kentucky, where he still is revered as the great naturalist who graced that campus from 1819 to 1826. In 1924, uneasy but ostensibly successful efforts were made to move Rafinesque's remains from Philadelphia to Lexington, to be placed in a tomb below the main stairs of Old Morrison, one of the campus buildings. However, decades of mistaken bookkeeping, hearsay, and hurried cemetery work contributed to an ironic error—at least so the evidence suggests.

Rafinesque was buried in Ronaldson's Cemetery at 9th and Bainbridge Streets, in South Philadelphia; the exact lot and grave is known (as noted but not identified by Boewe, 1987). But cemetery practices of the day allowed multiple burials within single graves, the first interment usually placed very deep. Such was the case in Rafinesque's grave, where six people occupied the same column, having been interred between 1831 and 1848. Rafinesque was the fourth of the six to be so uncerimoniously stacked. However, so far as Boewe (1987) has been able to reconstruct, the well-meaning people who dealt with bureaucratic pitfalls to remove Rafinesque's remains to Louisville did not dig deeply enough, and seem to have instead removed Mary Passimore (or Passmore), the fifth interree, who died at age 62 on May 28, 1847.

Before the site of Ronaldson's Cemetery was turned into the neighborhood playground it is today, many of the occupants were removed to other cemeteries; this was in 1950, and the site today is still a playground, partly paved but mostly grass. As Boewe (1987) pointed out, the remains of Revolutionary War veterans were reinterred in the cemetery at nearby Old Swedes Church, while the others were trucked 18 miles to the Forest Hills Cemetery in the Somerton section of the city. As he concluded (p. 235): "If the bulldozers went deep enough—that is, more than six feet—they scooped up all that was left of Rafinesque; if not, he now lies beneath the bounding feet of Society Hill soccer players. In either event, there is a kind of symmetry in the fact that, like his father, he lies in an unmarked grave, somewhere in Philadelphia."

To round out this story, it is known that Rafinesque lived the last years of his life (and died there) in a rented house at "172" Vine Street. This site, under the pre-1857 address scheme of Philadelphia, was on the north side of Vine Street between 5th

and 6th Streets, probably nearer to 6th. This block was until recently occupied by several large buildings housing small businesses and light industry. At the time this paper was being written the north side of Vine near 6th was being rebuilt to accommodate a redesigned Vine Street and the Vine Street Expressway connector between I-95 and the Schuylkill Expressway (I-76). The intersection also receives traffic entering Philadelphia from the Ben Franklin Bridge.

## 4

**Thomas Bellerby Wilson (1807-1865) and Samuel George Morton (1799-1851); [South] Laurel Hill Cemetery, off East River Drive.**

T. B. Wilson was an early benefactor of the Academy of Natural Sciences (as discussed later in this paper). His gifts of huge collections of specimens included thousands of paleontological specimens. The industry and philanthropy of Wilson was well memorialized by a committee of the Entomological Society (Entomological Society, 1865), and the reader is directed to that document for an interesting review of the life of Wilson.

S. G. Morton, also affiliated with the Academy, contributed many collections of paleontological specimens. Included among these specimens are items obtained from early collections on the American western frontier, particularly from the region of the Missouri valley. Although Morton made a successful living as a physician, his studies in medicine, craniology, ethnology, and archaeology made him well known and respected by his peers. He is most well remembered today for his outstanding collection of, and studies of, human crania. Published biographies of Morton include those of Meigs (1851) and Wood (1853).

Both of these men are buried in the south part of the Laurel Hill Cemetery, off East River Drive, on the east bank of the Schuylkill River, a short drive from the Academy. The cemetery is a historical one, containing many early Philadelphia patrons of the arts and sciences. The landscaping and architecture of the monuments there are especially exquisite.

## 5

**Joseph Willcox (1829-1918), 1810 Chestnut Street; 11th and Pine Streets.**

Joseph Willcox was a long-term Trustee of the Wagner Free Institute of Science (1878-1918). Although he also worked with the mineralogical collections at the Academy of Natural Sciences, it was he who was instrumental in collecting large numbers of paleontological specimens for both the Institute and the Academy of Natural Sciences. These specimens, mostly molluscs, are from many localities in the United States and elsewhere, from nearly all ages. It was Willcox who accompanied Angelo Heilprin on the first scientific exploring expedition to western Florida, in 1886, conducted under the auspices of the Wagner Free Institute, and he returned alone the next year to continue collecting.

In 1896, Willcox apparently made an attempt to retire from some of his researches in paleontology, as witnessed in a letter to Dr. Edward J. Nolan, of the Academy, written from Media, Pennsylvania, on July 10, 1886 (Library of the Academy of

Natural Sciences, Manuscript Collection 569; source also for other letters below):

"I am now out of business in connection with eocene [sic] fossils; having retired several weeks ago from all participation in that department of geology."

This was just five months before the death of Isaac Lea, whose Eocene molluscs Willcox would over 25 years later be in charge of curating. In 1912 he was placed as a curatorial assistant in charge of the Isaac Lea collection of Eocene molluscs, an appointment which he acknowledged on Academy stationery:

"To the Academy of Natural Sciences

"I cheerfully accept the position to which you have appointed me as custodian of the Isaac Lea collection of Eocene Mollusca [sic], under the curators; and I appreciate the confidence thus reposed in me.

"Respectfully yours  
"Joseph Willcox"

There is, however, another letter, dated January 27, 1914, written from his apartment in The Gladstone (for this location, see below):

"To the Academy of Natural Sciences

"I have received notice of my late appointment to the Academy as Custodian of the Isaac Lea collection of Eocene Mollusca which I accept, and I take this opportunity to offer my thanks for this honor conferred upon me.

"Respectfully  
"Joseph Willcox"

Little is known of Willcox's life in science (for a short summary, see in Spamer & Forster, 1988). However, from correspondence by Joseph Leidy to Willcox (Wagner Free Institute collections), and from correspondence by Willcox to Edward J. Nolan (Academy collections), we have determined that Willcox resided, at various times, at 1810 Chestnut Street and in two apartment houses, The Gladstone and The Clinton, near 11th and Pine Streets. However, Willcox travelled frequently from Philadelphia, leaving town for long periods of time. Some letters from him are addressed from Connecticut, Florida, and Media, Pennsylvania.

Regarding the Philadelphia addresses, Willcox lived at 1810 Chestnut Street around 1889, and later at the The Clinton and The Gladstone. A letter in the Academy's library, dated January 18, 1889, is from the Chestnut Street address. (Today, the Chestnut Street site is occupied by a auctioneer's gallery, and whether the building is that which Willcox saw, we do not know; it does resemble period apartment houses.) Another letter, dated February 18, 1912, is written from The Clinton, an apartment house next door to The Gladstone at 324 South 11th Street (which still exists as an apartment house, Clinton Place). Then there is a third letter, dated September 27, 1912, from The Gladstone, beginning in part, "I have lately returned to this smoky-dusty-boss ridden city, and have moved my furniture to the above address." (The Gladstone was apparently on the northwest corner of 11th and Pine Streets, a site occupied today by a small park.) A notice of the death of Isaac Lea, informing friends when they could call, was sent on December 9, 1886, from 1622 Locust Street. Whether this was a Willcox residence

or Lea's we have not been able to determine. The house at 1622 Locust is a large brownstone which could have been the private residence of Lea, or an apartment house in which Willcox lived. Today, it is occupied by law offices.

Joseph Willcox is buried in Ivy Mills, a small town along the west branch of Chester Creek, south of Philadelphia.

## Part II: The Academy of Natural Sciences of Philadelphia

No discussion of the history of American paleontology is complete without mentioning the Academy of Natural Sciences of Philadelphia. The Academy was a center of natural history in Philadelphia and shared the limelight with the long-established American Philosophical Society, founded in 1743 by Benjamin Franklin and friends. The paleontological collections at the Academy contain historical specimens such as those collected by Thomas Jefferson and by Lewis and Clark, passed along to the Academy by the American Philosophical Society. The collections of just the type fossils in the Academy now number in the thousands of lots; many of the species were described by such notable naturalists as Thomas Say, Timothy Conrad, Henry C. and Isaac Lea, Joseph Leidy, Edward Cope, Leo Lesquereux, William M. Gabb, Angelo Heilprin, and Henry A. Pilsbry, to name a few. Catalogues of the Academy's types have been prepared by Richards (1968), Gillette (1975; 1978a, b), Gillette & Colbert (1976), Gillette & Shapiro (1978), Olson & Gillette (1978), and Spamer (1988). The strong points of the collections overall, in addition to historically important material from the late 18th and the 19th centuries, are Cenozoic molluscs of the Atlantic and Gulf Coastal Plains (Invertebrate Paleontology), North American Pleistocene fossils and the Late Cretaceous fauna of the Judith River Formation of North Dakota (Vertebrate Paleontology), and Carboniferous and Cretaceous plants of the United States and England (Paleobotany). To commemorate 175 years of paleontology at the Academy of Natural Sciences, the following brief outline of the Academy's travels through town are presented for those who wish to make an Academic pilgrimage. (References for this section, not always cited in the text, include Ord, 1834; Nolan, 1909a, b; and Weiss & Ziegler, 1931.)

The Academy had quite humble beginnings, when a few men interested in natural history would get together on occasion to talk about their common hobby. One such gathering place was the apothecary of John Speakman, on the northwest corner of **2nd and High (now Market) Streets**; its street address at that time was probably "61 High Street." Today, this site is a small park (and see below for a note on street addresses in older Philadelphia).

Speakman suggested that the group meet more regularly, and the first scheduled meeting was at his house on the night of Saturday, January 25, 1812. Together with Speakman, Dr. Gerard Troost, Dr. C. M. Mann, Jacob Gilliams, John Shinn, Jr., and Nicholas S. Parmentier met on that evening; clearly, by the outcome, they thought it was a worthwhile thing they were doing. They met two or three times afterward at a public house, Mercer's Cake Shop, on **Market Street near the corner of Franklin Place**. (Franklin Place was a small street passing between Market and Chestnut Streets, bisecting the block between



3rd and 4th Streets; it was this area where Benjamin Franklin had his home. The street was later named Hudson Street, but today it is a pedestrian thoroughfare to Franklin Court, part of the Independence National Historical Park, where visitors may view archaeological work on the foundations of Franklin's home [including the Franklin privy].) The Academy meeting of March 17, 1812, at Mercer's Cake Shop, was the event which inaugurated the Academy. Attendees of that meeting decided that the origin of the Academy was officially on that date, and that a museum, library, and laboratory should be implemented as part of that organization.

It was Dr. Samuel Jackson of the University of Pennsylvania, at the March 17th meeting, who suggested the august title, The Academy of Natural Sciences of Philadelphia, although he himself did not become a member of the Academy. But the humble beginnings of the Academy were perhaps not so serious as the name might imply (Ord, 1834, p. 3):

"Of the origin of this highly respectable and useful institution, I shall at this time merely assert, that its founders had any thing in view but the advancement of science. Strange as this may appear, it is nevertheless true, that the club of humourists, which subsequently dignified the association under the imposing title of Academy, held its weekly meetings merely for the purpose of amusement; and, consequently, confined itself to those objects which it was thought would be most conducive to that end."

George Ord, incidentally, was one of the earliest members of the Academy and a staunch supporter of its activities and mission. He also accompanied the Academy's first scientific expedition, in 1818, to the Sea Islands, Georgia, and the west coast of Florida [then under Spanish rule]. Ord accompanied Thomas Say, Titian Peale, and William Maclure. A few specimens remain from this expedition--seven uncatalogued sponges relocated in 1987 in the Invertebrate Zoology Section of the Department of Malacology.

On about April 1, 1812, a room was rented on a second floor over a milliner's shop at "121" North 2nd Street, where the library and museum were begun. (Although we have an exact address, the precise location of the Academy is problematical. The scheme of address numbers in Philadelphia was modified in 1857, so the addresses of the Academy's earliest days do not correspond to the current numbers. [For keys to the old address scheme, see, for example, Bywater, 1850.] No. 121 of the Academy's day, on the east side of the street, was approximately where the Ben Franklin Bridge now passes over 2nd Street, just north of Race Street.)

When one considers the size and historical importance of the Academy's collections and library today, we can look back at the beginning with some amazement and amusement (Ord, 1834, pp. 3-4):

"... the whole collection consisted of some half a dozen common insects, a few madrepores and shells, a dried toad fish and a stuffed monkey: a display of objects of science calculated rather to excite merriment than to procure respect, but which, in the end, proved to be the nucleus of one of the most beautiful and valuable collections in the United States."

The meeting of May 7th saw the election of the first officers of the Academy, which left amongst the membership just one member without office: Gerard Troost, President; N. S. Parmentier and John Shinn, Jr., Vice Presidents; John Speakman,

Treasurer; Jacob Gilliams, Controller; Thomas Say, Conservator; Dr. C. M. Mann, Secretary; and Dr. John Barnes, member. Quickly needing more room for its holdings, in September, 1812, the Academy rented an apartment on the second floor of a house at "78" North 2nd Street, which the members called the Hall of the Academy. At the time, the Academy counted only 14 members and 33 correspondents. No. 78, on the west side of the Street, was in those days nearly at Race Street.

The quarters at 78 North 2nd Street satisfied the Academy's needs until 1815 when Jacob Gilliams built a new hall in the rear of his father's home at "35" Arch Street, in Gilliams' Court. After the address changes of 1857, this address became 127 Arch Street; it is in the middle of the north side of the block. The house, still containing the rear addition and an alleyway to the rear between 127 and 125, was still standing in 1860 when new ward maps of the city were made (Hexamer & Locher, 1860). The site today is a five-storey brick building with a steel garage door in its front; the only distinguishing markings are "Keep Out." The presence of a scar on the wall between the second and third floors, the size and shape of an old private fire company identification marker, suggests that it may have been removed from the original structure. It was either in this hall or at 78 North 2nd Street where William Wagner, who went on to found the Wagner Free Institute, was elected a member of the Academy on May 13, 1815, at the age of 19.

Much of the early growth of the Academy was the result of the philanthropy of William Maclure (1763-1840), the geologist. An early president of the Academy, Maclure was the first stellar benefactor of this institution, donating a huge number of books and later infusing the Academy with needed money, and indeed, rescuing the Academy from many of its financial obligations. (For biographies of Maclure, see Morton, 1841, and Moore, 1947.)

It was just before or during these early years of the Academy when young Thomas Say had gone into business with John Speakman, having learned the apothecary's trade from his father, Benjamin Say. To the advantage of American science, the firm of Speakman & Say was quickly bankrupted. As Weiss & Ziegler (1931, p. 34) noted, "Speakman very generously assumed the active management of the shop so that Say's time could be devoted to natural history." Say never attempted to re-enter business and thereafter devoted his life to the natural sciences. During the early Academy years, he spiritually and actually lived in the Academy (Weiss & Ziegler, 1931, p. 35):

"After this unfortunate happening, Say, who was about twenty-five years old, made no effort to recover his losses, but gave himself up entirely to natural history, living in the rooms of the Academy, on the plainest food, usually bread and milk, with an occasional chop or an egg which he himself cooked, and sleeping, so it has been said, under the skeleton of a horse."

The Academy did not move again until 1826, when it occupied a Swedenborgian church on the southeast corner of 12th and Sansom (then George) Streets, placing itself in debt \$3,000 to renovate the building. (Today, the corner is a parking garage.) It was there that its museum was first opened to the public, in 1828, just after the death of Charles Willson Peale, whose Philadelphia Museum was one of the attractions of this town (see Appel, 1980). An undated circular, once in the possession of Isaac Lea and now in the Wagner Free Institute ar-

chives, released from this address, indicates that the Academy had in its collections 3,000 minerals, 3,500 "Petrifactions and other Geological specimens", 1,200 species of shells, 300 species of "Crustaceous animals, Corals, &c.," 120 species of reptiles, and 5,000 plants; and, "To these must be added small, but increasing collections of Quadrapeds, Birds, Fishes, Insects, &c. &c."

It was during this period that Philadelphia began to lose some of its naturalists to the utopian endeavors of the commune established at New Harmony, Indiana (for information on New Harmony, see Lockwood, 1902; Fretageot & Mangrum, 1914; Bestor, 1948; Carmony & Elliot, 1980). William Maclure and Thomas Say were among those who emigrated to that frontier, and it was Maclure who made a quotable prediction about not just science in Philadelphia, but Philadelphia-proper (Weiss & Ziegler, 1931, p. 161):

"Refusing to invest money in Philadelphia, he said, 'Land in the cities can no longer rise in value. The communistic system must prevail, and in the course of a few years Philadelphia must be deserted; those who live long enough may come back here and see the foxes looking out of the windows.'"

By 1840, foxes notwithstanding, the Academy had grown large enough to move yet again, this time to a building at the **northwest corner of Broad and Sansom Streets**, which the Academy purchased for \$13,333. (Today the site is occupied by a large, though not modern, office building.) However, the move to its new quarters cost just \$34, the physical labor being performed largely by the members. The library and collections were installed on the second floor. It was at this address, in 1845, that Dr. Joseph Leidy, probably one of the most well-known of Academy members and future president, was inducted into the membership; and it was here that the celebrated type specimen of *Hadrosaurus foulkii* Leidy was brought from Haddonfield, New Jersey.

The Academy's building was enlarged 30 feet westward in 1847, and the library was moved to the basement. In 1855, a third story, 24 feet high, was added at a cost of \$12,263; collections were moved into it, and the library moved into the emptied space in the front of the building. The 1847 construction just followed the disbanding of the Philadelphia Museum, operated by the sons of Charles Willson Peale after their father's death, and occurred at the same time that William Wagner was beginning his free lectures in science. Although the Academy's museum was open to the public, its hours had to be somewhat restricted and admission had to be obtained by pass from a member of the Academy. Some problems were met with the public, as Joseph Leidy pointed out in a report to the Academy, dated December 26, 1848 (Leidy, 1848, pp. 135-136):

"The unrestricted admission of persons to the museum of the Academy upon the afternoons of Tuesdays and Saturdays, having been found to be attended with some injury and even destruction of its furniture, caused the Society, last year, to change one of the days of exhibition, viz. Saturday to Friday, and to issue gratuitous tickets of admission, to be obtained from members upon application. This arrangement has been followed by the most beneficial effects; persons really desirous of inspecting the collections, take the trouble to procure a ticket, with which they feel responsible for their conduct; the introduction of crowds is also avoided, which, from constant motion, give rise to dust, so detrimental to the more perishable articles in a natural history collection. The janitor, who keeps a register of the names and residences of visitors to the Museum on

the Exhibition days, informs me that upwards of three thousand persons have availed themselves since the middle of May last, when the new arrangement went into effect. This is an average of about 380 admissions per month, or nearly 5000 per annum."

Some of the most important additions to the Academy's collections were made during its stay at Broad and Sansom from the astounding efforts of Thomas B. Wilson. Traveling abroad, Wilson tapped his personal fortune to obtain whole natural history cabinets, giving to the Academy tens of thousands of specimens of botanical, zoological, geological, and paleontological interest. He also impressed well upon his brother, Edward, the importance of his work, and Edward subscribed to the Academy in kind. Tireless in his personal pursuit of knowledge, T. B. Wilson's public gifts of collections were also made solely for the advancement of scientific understanding. His financial gifts were equally as unselfish as were his gifts of specimens and books. As summarized in a committee's memorial to Wilson (Entomological Society, 1865, p. 9):

"While the building and the library are mainly the donations of Maclure and the brothers Wilson, the fact stands out still more prominently that the Museum of the Academy is mainly the donation of Dr. Wilson, considerably assisted by his brother Edward Wilson."

It is to this memorial that the reader is referred for much more information on the life and deeds of T. B. Wilson.

Other acquisitions which went into the Academy at Broad and Sansom Streets included Thomas Jefferson's collection of fossils and some of Lewis and Clark's collections. In 1849, the American Philosophical Society distributed many of its natural history and ethnological holdings to institutions where they could be better used. The Academy received Jefferson's fossils, as well as the plants, geological specimens, and a fossil collected by Lewis and Clark. (For more on the Jefferson collection, see Bedini, 1985.)

The present site of the Academy, at the **southwest corner of 19th and Race Streets**, where the Benj. Franklin Parkway cuts through Logan Square, was opened in 1876, although plans for a new site were begun as early as 1865. The land cost \$65,298, and the building \$193,682.29. The timing of the opening was such that as much revenue as possible could be taken in from visitors to the Centennial Exhibition held in Philadelphia; but few people ventured from the fair grounds in Fairmount Park. At the time, some 65,000 specimens were in the paleontological collections (Westcott, 1876, p. 184).

In 1889, the Pennsylvania Legislature appropriated (after some considerable lobbying, in part by Angelo Heilprin) \$50,000 toward an extension of the Academy's building. Invitations from the University of Pennsylvania, in 1889 and 1890, to move to that campus were soundly declined by the Academy. This extension added a wing along 19th Street toward Cherry Street, which was available for use in 1892. The remaining frontage along 19th and Cherry Streets was used when, in 1908, the Legislature appropriated \$150,000 to construct a new lecture hall, library reading room (still in use today) and a five-tiered stack building for the library collection; this was completed in 1912. The research wing attached to the west side of the building, and the auditorium in the old northern courtyard, were added in 1978. Presently, a capital campaign is being conducted by the Academy to obtain the funds to build a much needed new library



stack building in the southern courtyard, and for additional museum, office, and collections space.

The bronze statue of Dr. Joseph Leidy that stands in front of the Academy, facing Logan Square, was presented to the City of Philadelphia by the Memorial Committee of Representative Citizens, assembled to so honor Leidy's memory. Sculpted by Samuel Murray, the eight-foot-six-inch-tall figure, atop a ten-foot granite base, was placed originally in 1907 at the southwest corner of City Hall although Academy representatives on the committee preferred that it be placed at the Academy. Plans were made as early as 1909 to have the statue moved to the Academy (Nolan, 1909), but it was not moved there until 1930 when realignment of the Market Street Subway tracks beneath City Hall required the statue's removal (Brenner, 1987). As Hinsdale (1948, p. 290), a contemporary of Leidy, remarked about the statue:

"It represents Prof. Leidy in an ordinary lounge suit as if addressing a class. Incidentally, I have never seen Leidy in any other suit; even at Commencements he declined to wear the conventional cap and gown customary of all American and many European universities. But one would suppose that as the senior member of a very distinguished faculty he would have conformed to the prevailing custom."

In February, 1987, the Leidy statue was moved yet again, a few feet westward, to make room for the animate sculpture of two *Deinonychuses*. While the granite pedestal was being moved, Dr. Leidy reposed overnight on the sidewalk, and a rare, more intimate, perspective of this man was thus afforded the passer-by (Figure 1). This also made available to closer inspection the jaw of the type of *Felis atrox* Leidy, 1853 (ANSP 12546), which the sculptor faithfully reproduced in Leidy's hand. The *Deinonychus* sculpture, by Kent Ullberg, was dedicated April 29, 1987, to celebrate the Academy's 175th anniversary and to honor the Women's Committee of the Academy "for their loyalty and dedication to this institution."

### Part III: The Paleontology of Philadelphia

The geological layout of the City of Philadelphia sees this town on the sedimentary cover between the Delaware and Schuylkill Rivers, at the very edge of the Atlantic Coastal Plain, lapping up onto the edge of the Piedmont Province here characterized by the metamorphosed basement of the Wissahickon Formation (metamorphic age of ?Ordovician). One does not usually think of Philadelphia as a source of paleontological material. Fortuitous, fleeting glimpses into the subsurface of central Philadelphia, in the deep holes prepared for new skyscrapers, show beneath the disturbed layer of former shallow cellars a blanket of river sediments, probably incorporating materials derived from glacial outwashes of the Pleistocene. Beneath this blanket often lie relatively thin clays and sands characteristic of Coastal Plain deposits; but, to our knowledge, no fossils have been reported from these sediments. Beneath these layers is a saprolite of chemically decomposed Wissahickon Formation, grading into the solid country rock of the Wissahickon. (Two valuable early views of Philadelphia geology were presented by Lewis, 1880, 1883.)

The surface of the Wissahickon Formation is quite uneven, and the sedimentary cover is of variable thickness, as demonstrated by the views taken near the Academy of Natural

Sciences. A hole about 45 feet deep was dug in 1987 at the northwest corner of 19th and Market Streets. Two or three thin Coastal Plain-like strata were seen, the bottom one of which is a very hard, dark grey, micaceous clay with no indication of a saprolite. In 1988, on the east side of 18th Street between Market Street and J. F. Kennedy Boulevard, the former underground Greyhound bus terminal was vacated and excavated. Only brown sands and clayey sands were visible in the bottom of the pit below the old terminal floor, between about 20 and 30 feet below street level. The beds dip consistently to the northeast at about 10° to 15°. On the north side of Chestnut Street between 16th and 17th Streets, the large excavation for the second Liberty Center tower in 1988 showed interbedded brown sands, gravels, and thin dark clays to a depth of about 35 feet. The gravels were confined mostly to the upper-central part of the section, and all beds had thicknesses measured in inches to a few feet. None of the individual gravel beds were thicker than a foot, and the clay beds were each just a few inches thick. All beds were nearly horizontal, with dips of a few degrees to the northeast. At neither the bus terminal nor at Two Liberty Center was a saprolite seen. Another hole, about 35 feet deep, dug in 1987 at the northeast corner of 18th and Arch Streets, showed water-saturated mixed dark grey clays and dark brown sands, incorporating two layers of large cobbles; again, there was no indication of a saprolite. A channel filled with cobbles and clay was seen running approximately northeast in the southwest part of the pit. Beneath the Academy itself, the surface of the Wissahickon is not too deep, as shown by sediments retrieved from drillings made in 1987 in preparation for the new library stack building in the southern courtyard. Beneath the disturbed layer there is a thin layer of stream sediments (the Academy having been built just to the north of a small stream) with a saprolite immediately beneath; the saprolite is met, within the confines of the small courtyard, at 13 feet on the east and 24 feet on the west.

Despite the largely unfavorable circumstances for the preservation of fossils in Philadelphia, some scattered occurrences do, in fact, come to light. The bane of many a geologist today is the presence of constructions which obscure the land which he or she wishes to study. But sometimes construction exposes, albeit briefly, pieces of the geological story and, once in a great while, fossils. One such instance was the discovery in July, 1931, of the "Subway Tree" at 8th and Locust Streets, during the construction of the Locust Street Subway (the subway is now part of the Port Authority Transit Corporation [PATCO] High Speed Line to New Jersey).

Henry H. Quimby, a consulting engineer for the Golder Construction Company, notified the Academy of Natural Sciences of the discovery of well preserved stumps of trees. As noted in the *Public Ledger* for August 7, 1931:

"Quimby said workmen had been encountering trees for the last week in the excavation. So far, the excavation shows that the forest covered an area 100 feet wide from a point on 8th street in front of the Morris House, 225 South 8th street, to a point on Locust street about 100 feet west of 8th.

"Workmen first encountered smaller tree stumps while excavating in advance of the subway digging to place underpinning beneath 8th street houses."

The large tree stump which drew the attention of Quimby and the Academy measured 17 feet in circumference and was later



Figure 1. A piece of the "Subway Tree", *Taxodium distichum* (Linne) (WFIS 15868), unearthed during subway excavations near the corner of Eighth and Locust Streets, July, 1931.

identified as the bald cypress *Taxodium distichum* (Linne), pieces of which were collected and displayed by the Academy of Natural Sciences. The stumps in the subway excavations were found upright, 38 feet below street level, at 10 feet below sea level, in Pleistocene blue clay and swamp sod (Richards, 1931). Although dated indirectly by sedimentological appearances, apparent stratigraphic position, modern ranges of the bald cypress, and historical records of central Philadelphia, proof of the Pleistocene age of the Subway Tree was not forthcoming for another 29 years, when specimens from the Academy were sent for carbon-14 dating at the University of Pennsylvania. The report, cited by Richards (1960, p. 107), indicated that the sample "is definitely older than 36,600 years and probably older than 42,200 years." Based on this evidence, Richards' (1931) indirect age determination was correct, and the occurrence of the tree does indeed appear to be in the Cape May Formation (primarily sand, occurring widely through southern New Jersey).

A search of the Paleobotany Collection at the Academy has failed to turn up anything positively related to the Subway Tree. Although many unlabelled pieces of well preserved fossil cypress are found in the Academy's collection, such material is abundant from Pleistocene deposits of nearby southern New Jersey, and well represented in the Academy's collection; it is equally probable that the unlabelled specimens are from those areas. However, a piece of cypress in the collections of the Wagner Free Institute of Science (WFIS 15868) is identified as being from the tree found at 8th and Locust; it is illustrated in Figure 1.

Fossil wood is apparently not unusual in Philadelphia. Richards (1931) made note of occurrences of carbonized wood during the subway construction which unearthed the Subway Tree. Although he did not elaborate on these specimens, they could have been historical in age, a definite possibility in near-surface finds of any kind in an established urban environment. However, when the Subway Tree was unearthed, Samuel G. Gordon of the Academy of Natural Sciences remarked [*Public Ledger*, August 7, 1931], "Similar trees have been uncovered at 18th and Arch streets and during the excavation for the Broad street subway. But this tree is in a better state of preservation and we should be able to identify what species it belongs to." More recently, in 1987, drillers working along Boat House Row, along East River Drive north of the Art Museum, reported strik-

ing wood 20 feet or more beneath the surface. The area appears to be a point bar built up along the Schuylkill River where the Wissahickon Formation crops out along the boundary between the Coastal Plain and Piedmont provinces; and Boat House Row is situated on that bar. The wood may be of historical age, rather than Pleistocene, but could predate the European occupation of the Philadelphia area. Presumably, similar occurrences of wood are to be found throughout Philadelphia.

Another item of Philadelphia paleontological trivia is found in the Invertebrate Paleontology Collection at the Academy of Natural Sciences. The item is a broken piece of a small eroded quartzite cobble that contains at least two well defined burrows identified as the ichnofossil *Skolithos linearis* Haldeman, 1840 (ANSP 13715; Figure 2). It was collected by Joseph Leidy in 1882 from a gravel deposit on the campus of the University of Pennsylvania, in West Philadelphia. Leidy noted three such specimens in print (Leidy, 1882), but two of them cannot be located. They were described as being in a river gravel of "Potsdam" age, or Early Cambrian. Howell (1943) determined

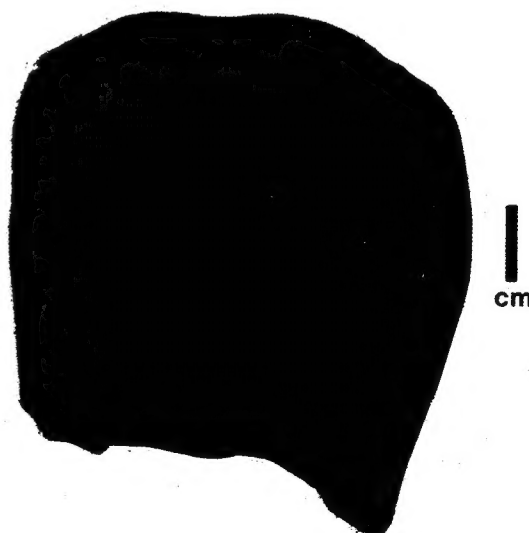


Figure 2. Cobble of Early Cambrian Chickies Quartzite containing *Skolithos linearis* Haldeman (ANSP 13715), collected by Joseph Leidy in 1882 on the campus of the University of Pennsylvania. Figured here for the first time.



that the cobbles collected by Leidy had been deposited in Philadelphia as Pleistocene outwash, derived from the Early Cambrian Chickies Quartzite in which *Skolithos* is well known. The nearest outcrops of the Chickies to Philadelphia are some distance away, as in Valley Forge, Montgomery County.

### Conclusion

Philadelphia is one of those rare cities which stimulates the imagination of the past. Historical sites abound, of course, this being the birthplace of a nation; but beyond the political history is a rich cultural heritage which surprises the walker. Indeed, a walking tour of parts of the city is certainly a more rewarding, and recommended, perspective. Everywhere in the older part of the city there are structures which have been designed by some of the more renowned architects of America, and the history of the occupancy of these structures is often rich in lore. Take, for example, the tour of the Academy of Natural Sciences through town. What today are blank facades, often seemingly lacking character, hide a wonderful history of people and deeds. Even if the structure has been erased from being, the site can still suggest to the visitor what took place there by stimulating the imagination. Every aspect of culture, whether it be the fine arts, physical science, or human history, can provide the town walker with an equally informative story, if one takes the time to read it. This paleontological pilgrimage, though not by any means complete, is just one of several editions of the Philadelphia Story.

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